# POPLAR RIVER

# COOPERATIVE MONITORING

# ARRANGEMENT



## 1987

# FIRST QUARTER DATA EXCHANGE

# UNITED STATES CONTRIBUTION

PLEASE RETURN

MAY 1987

# INTRODUCTION

## 1987 - FIRST QUARTER DATA EXCHANGE
## POPLAR RIVER BASIN

The Poplar River Bilateral Monitoring Committee was authorized by the Governments of Canada and the United States under the Poplar River Cooperative Monitoring Arrangement dated September 23, 1980. The Committee is composed of representatives of the Governments of the United States, State of Montana, Canada, and Province of Saskatchewan. In addition to the representatives of governments, two ex officio members, who are local representatives of the State of Montana and Province of Saskatchewan, participate in activities of the Committee.

One responsibility of the Committee includes the on-going quarterly exchange of results of water quantity, water quality and air quality monitoring programs. The programs are being conducted in Canada and the United States at or near the International Boundary by cooperative monitoring agencies in accordance with the Technical Monitoring Schedules. Monitoring information is to be transmitted by each Committee co-chairman to his counterpart co-chairman within a reasonable period after the termination of each quarter. In addition, preselected parties are to receive copies of the quarterly exchange.

This package represents information collected by United States sources for the Poplar River basin during the first quarter of 1987. Included are data for surface water quantity, surface water quality, ground-water levels, and air quality. The large amount of air quality data precludes it from being incorporated onto the data report. Hence, it is separate.

## STREAMFLOW MONITORING

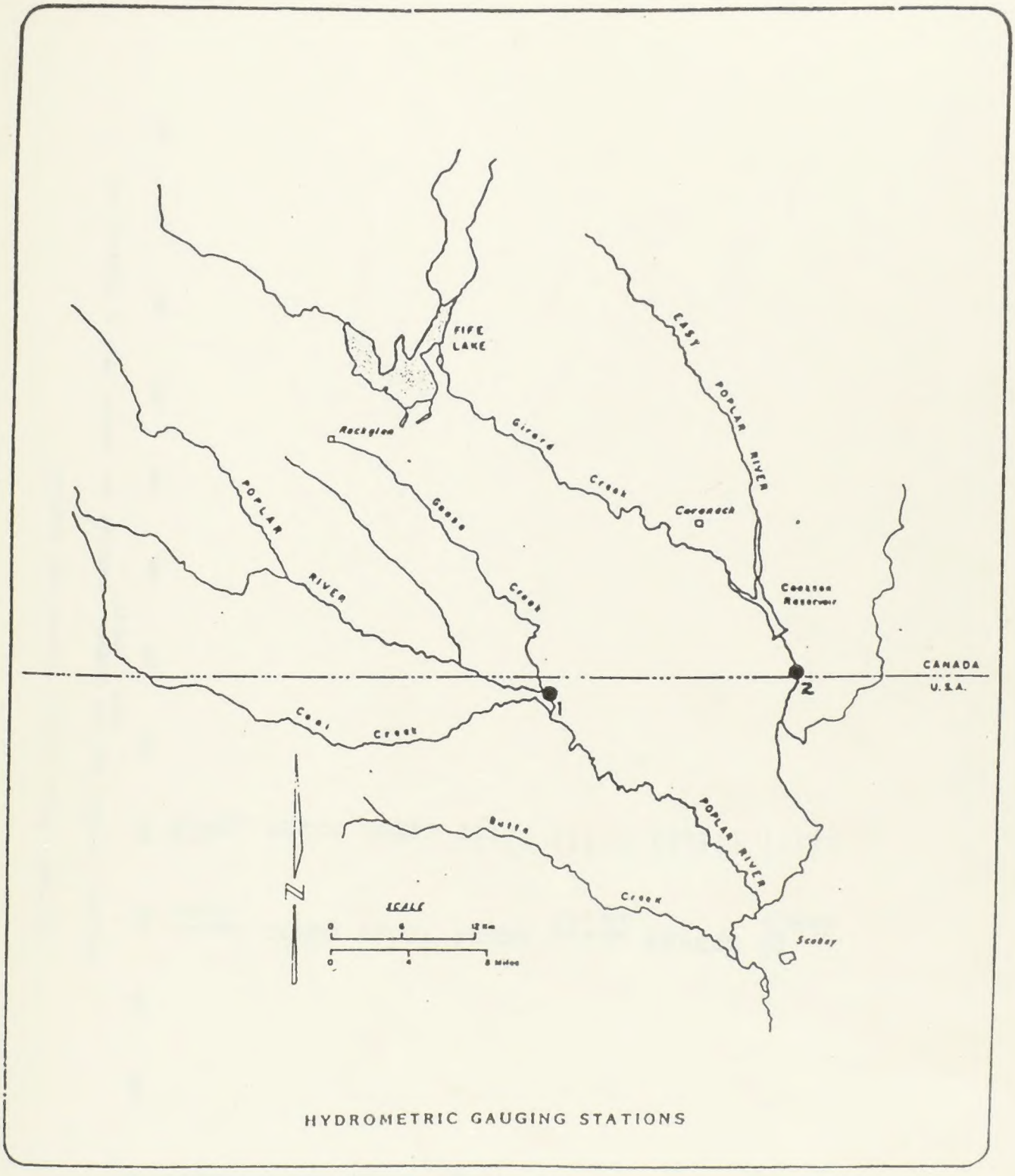
Responsible Agency: U.S. Geological Survey

Daily mean discharge or levels and instantaneous monthly extremes as normally published in surface water data publications.

| No. on Map | USGS Station No. | Station Name |
|---|---|---|
| 1 | 06178000 | Poplar River at International Boundary |

Responsible Agency: Environment Canada

| | | |
|---|---|---|
| 2 | 06178500 | East Poplar River at International Boundary |




HYDROMETRIC GAUGING STATIONS

06178000 POPLAR RIVER AT INTERNATIONAL BOUNDARY

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987
MEAN VALUES

| DAY | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 5.0 | 160 | | | | | | | | |
| 2 | | | 4.0 | 220 | | | | | | | | |
| 3 | | | 5.0 | 150 | | | | | | | | |
| 4 | | | 8.0 | 93 | | | | | | | | |
| 5 | | | 10 | 47 | | | | | | | | |
| 6 | | | 15 | 34 | | | | | | | | |
| 7 | | | 20 | 28 | | | | | | | | |
| 8 | | | 15 | 26 | | | | | | | | |
| 9 | | | 12 | 26 | | | | | | | | |
| 10 | | | 10 | 24 | | | | | | | | |
| 11 | | | 9.0 | 22 | | | | | | | | |
| 12 | | | 10 | 21 | | | | | | | | |
| 13 | | | 11 | 20 | | | | | | | | |
| 14 | | | 12 | 19 | | | | | | | | |
| 15 | | | 11 | 18 | | | | | | | | |
| 16 | | | 11 | --- | | | | | | | | |
| 17 | | | 11 | --- | | | | | | | | |
| 18 | | | 10 | --- | | | | | | | | |
| 19 | | | 10 | --- | | | | | | | | |
| 20 | | | 10 | --- | | | | | | | | |
| 21 | | | 9.0 | --- | | | | | | | | |
| 22 | | | 9.0 | --- | | | | | | | | |
| 23 | | | 8.0 | --- | | | | | | | | |
| 24 | | | 8.0 | --- | | | | | | | | |
| 25 | | | 8.0 | --- | | | | | | | | |
| 26 | | | 10 | --- | | | | | | | | |
| 27 | | | 14 | --- | | | | | | | | |
| 28 | | | 20 | --- | | | | | | | | |
| 29 | | | 28 | --- | | | | | | | | |
| 30 | | | 38 | --- | | | | | | | | |
| 31 | | | 50 | --- | | | | | | | | |
| TOTAL | | | 411.0 | --- | | | | | | | | |
| MEAN | | | 13.3 | --- | | | | | | | | |
| MAX | | | 50 | --- | | | | | | | | |
| MIN | | | 4.0 | --- | | | | | | | | |
| AC-FT | | | 815 | --- | | | | | | | | |

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987
MEAN VALUES

| DAY | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.6 | 2.8 | 2.8 | 4.3 | | | | | | | | |
| 2 | 2.6 | 2.8 | 2.8 | 4.1 | | | | | | | | |
| 3 | 2.6 | 2.8 | 3.0 | 3.8 | | | | | | | | |
| 4 | 2.6 | 2.8 | 3.3 | 3.5 | | | | | | | | |
| 5 | 2.6 | 2.8 | 3.5 | 3.5 | | | | | | | | |
| 6 | 2.6 | 2.9 | 3.6 | 3.5 | | | | | | | | |
| 7 | 2.5 | 3.1 | 3.7 | 3.5 | | | | | | | | |
| 8 | 2.5 | 3.0 | 3.3 | 3.3 | | | | | | | | |
| 9 | 2.5 | 2.9 | 2.9 | 4.6 | | | | | | | | |
| 10 | 2.4 | 3.0 | 2.8 | 5.7 | | | | | | | | |
| 11 | 2.5 | 2.9 | 2.8 | 4.7 | | | | | | | | |
| 12 | 2.6 | 3.1 | 2.8 | 3.9 | | | | | | | | |
| 13 | 2.7 | 2.9 | 2.9 | 3.4 | | | | | | | | |
| 14 | 2.5 | 2.9 | 3.0 | 3.1 | | | | | | | | |
| 15 | 2.3 | 2.9 | 3.0 | 3.0 | | | | | | | | |
| 16 | 2.4 | 2.8 | 3.0 | --- | | | | | | | | |
| 17 | 2.4 | 2.9 | 3.0 | --- | | | | | | | | |
| 18 | 2.5 | 2.9 | 3.0 | --- | | | | | | | | |
| 19 | 2.5 | 3.0 | 3.0 | --- | | | | | | | | |
| 20 | 2.5 | 3.0 | 3.1 | --- | | | | | | | | |
| 21 | 2.6 | 2.9 | 3.2 | --- | | | | | | | | |
| 22 | 2.6 | 2.9 | 3.2 | --- | | | | | | | | |
| 23 | 2.5 | 2.9 | 3.1 | --- | | | | | | | | |
| 24 | 2.6 | 2.8 | 3.0 | --- | | | | | | | | |
| 25 | 2.5 | 2.9 | 3.1 | --- | | | | | | | | |
| 26 | 2.6 | 3.0 | 3.5 | --- | | | | | | | | |
| 27 | 2.6 | 2.8 | 3.7 | --- | | | | | | | | |
| 28 | 2.6 | 2.8 | 3.2 | --- | | | | | | | | |
| 29 | 2.7 | --- | 3.0 | --- | | | | | | | | |
| 30 | 2.8 | --- | 3.1 | --- | | | | | | | | |
| 31 | 2.8 | --- | 3.7 | --- | | | | | | | | |
| TOTAL | 79.3 | 81.2 | 97.1 | --- | | | | | | | | |
| MEAN | 2.56 | 2.90 | 3.13 | --- | | | | | | | | |
| MAX | 2.8 | 3.1 | 3.7 | --- | | | | | | | | |
| MIN | 2.3 | 2.8 | 2.8 | --- | | | | | | | | |
| AC-FT | 157 | 161 | 193 | --- | | | | | | | | |

SURFACE WATER QUALITY MONITORING

Station Location

Responsible Agency: U.S. Geological Survey

| No. on Map | USGS Station No. | Station Name |
|---|---|---|
| 1 | 06178000 | Poplar River at International Boundary |
| 2 | 06178500 | East Poplar River at International Boundary |
| 3 | 06179000 | East Poplar River near Scobey |

PARAMETERS

| WATSTORE* Code | Parameter | Analytical method | No. | Sampling Frequency 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| 00410 | Alkalinity-field | Elect. Titration | | M | M | M |
| 90410 | Alkalinity-lab | Elect. Titration | | M | M | M |
| 01106 | Aluminum-diss | AA | | SA | SA | SA |
| 00610 | Ammonia-tot | Colorimetric | | M | M | M |
| 00625 | Ammonia+Org N-tot | Colorimetric | | M | M | M |
| 01000 | Arsenic-diss | AA, hydride | | SA | SA | SA |
| 01002 | Arsenic-tot | AA, hydride | | A | A | A |
| 01010 | Beryllium-diss | AA | | SA | SA | SA |
| 01012 | Beryllium-tot/rec | AA-Persulfate | | A | A | A |
| 01020 | Boron-diss | Colorimetric | | M | M | M |
| 01025 | Cadmium-diss | AA | | SA | SA | SA |
| 01027 | Cadmium-tot/rec | AA-persulfate | | A | A | A |
| 00915 | Calcium | AA | | M | M | M |
| 00680 | Carbon-tot Org | Wet Oxidation | | SA | SA | SA |
| 00940 | Chloride-diss | Ion chromatography | | M | M | M |
| 01030 | Chromium-diss | AA | | SA | SA | SA |
| 01034 | Chromium-tot/rec | AA-persulfate | | A | A | A |
| 00080 | Color | Electrometric, visual | | M | M | M |
| 00095 | Conductivity | Wheatstone Bridge | | M | D | M |
| 01040 | Copper-diss | AA | | SA | SA | SA |
| 01042 | Copper-tot/rec | AA-persulfate | | A | A | A |
| 00061 | Discharge-inst | Direct measur. | | M | M | M |
| 00950 | Fluoride | Electrometric | | M | M | M |
| 01046 | Iron-diss | AA | | M | M | M |
| 01045 | Iron-tot/rec | AA-persulfate | | A | A | A |
| 01049 | Lead-diss | AA | | SA | SA | SA |
| 01051 | Lead-tot/rec | AA-persulfate | | A | A | A |
| 00925 | Magnesium-diss | AA | | M | M | M |
| 01056 | Manganese-diss | AA | | SA | SA | SA |
| 01055 | Manganese-tot/rec | AA-persulfate | | A | A | A |
| 01065 | Nickel-diss | AA | | SA | SA | SA |
| 01067 | Nickel tot/rec | AA-persulfate | | A | A | A |
| 00615 | Nitrite-tot | Ion-chromatography | | M | M | M |
| 00630 | Nitrate+Nitrite-tot | Colorimetric | | M | M | M |
| 00300 | Oxygen-diss | Winkler/meter | | M | M | M |
| 70507 | Phos, Ortho-tot | Colorimetric | | M | M | M |
| 00400 | pH | Electrometric | | M | M | M |
| 00665 | Phophorous-tot | Colorimetric | | M | M | M |
| 00935 | Potassium-diss | AA | | M | M | M |
| 00931 | SAR | Calculated | | M | M | M |
| 80154 | Sediment-conc. | Filtration-gravimetric | | M | M | M |
| 80155 | Sediment-load | Calculated | | M | M | M |
| 01145 | Selenium-diss | AA, hydride | | SA | SA | SA |
| 01147 | Selenium tot/rec | AA, hydride | | A | A | A |
| 00955 | Silica | Colorimetric | | M | M | M |
| 00930 | Sodium | AA | | M | M | M |
| 00945 | Sulfate-diss | Colorimetric | | M | M | M |
| 70301 | Total Dissolved Solids | Calculated | | M | M | M |
| 00010 | Temp Water | Toluene | | M | M | M |
| 00020 | Temp Air | Toluene | | M | M | M |
| 00076 | Turbidity | Nephelometric | | M | M | M |
| 80020 | Uranium-diss | Fluorimetric | | - | MC | - |
| 01090 | Zinc-diss | AA | | SA | SA | SA |
| 01092 | Zinc-tot/rec | AA-persulfate | | A | A | A |

*Computer storage and retrieval system - USGS

Symbols: C-continuous; D-daily; M-monthly; MC-monthly composite; A-annually at high flow; SA-semi-annually at low and high flow; AA-atomic absorption; tot-total; rec-recoverable; diss-dissolved


SURFACE WATER QUALITY MONITORING STATIONS

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | TEMPERATURE, AIR (DEG C) (00020) | BAROMETRIC PRESSURE (MM OF HG) (00025) | CLOUD COVER (PERCENT) (00032) | WIND SPEED (MILES PER HOUR) (00035) | WEATHER (WMO CODE NUMBER) (00041) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | TURBIDITY (NTU) (00076) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (US/CM) (00095) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB 1987 | | | | | | | | | | | |
| 18... | 1000 | 0.0 | 0.0 | 707 | 0 | E5.0 | 0 | 5.0 | -- | 90 | 482 |
| MAR | | | | | | | | | | | |
| 17... | 1200 | 0.5 | 1.0 | 703 | 100 | E5.0 | 2 | 11 | 1.2 | 55 | 735 |

| DATE | OXYGEN, DISSOLVED (MG/L) (00300) | OXYGEN, DISSOLVED (PERCENT SATURATION) (00301) | PH (STANDARD UNITS) (00400) | PH LAB (STANDARD UNITS) (00403) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605) | NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610) | NITROGEN, NITRITE TOTAL (MG/L AS N) (00615) | NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625) | NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630) | PHOSPHORUS, TOTAL (MG/L AS P) (00665) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB 1987 | | | | | | | | | | | |
| 18... | 10.6 | 78 | 8.2 | 8.03 | 2.6 | 1.1 | 0.02 | 0.01 | 1.1 | <0.10 | 0.11 |
| MAR | | | | | | | | | | | |
| 17... | 10.4 | 78 | 8.0 | 7.99 | 6.1 | 0.99 | 0.01 | <0.01 | 1.0 | <0.10 | 0.05 |

| DATE | CARBON, ORGANIC TOTAL (MG/L AS C) (00680) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) | SODIUM, DISSOLVED (MG/L AS NA) (00930) | SODIUM ADSORPTION RATIO (00931) | PERCENT SODIUM (00932) | POTASSIUM, DISSOLVED (MG/L AS K) (00935) | CHLORIDE, DISSOLVED (MG/L AS CL) (00940) | SULFATE DISSOLVED (MG/L AS SO4) (00945) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB 1987 | | | | | | | | | | | |
| 13... | -- | 170 | 0 | 32 | 21 | 41 | 1 | 33 | 10 | 3.8 | 55 |
| MAR | | | | | | | | | | | |
| 17... | 8.5 | 240 | 0 | 45 | 30 | 78 | 2 | 41 | 7.7 | 4.4 | 95 |

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA

| DATE | FLUORIDE, DISSOLVED (MG/L AS F) (00950) | SILICA, DISSOLVED (MG/L AS SIO2) (00955) | ARSENIC DISSOLVED (UG/L AS AS) (01000) | ARSENIC TOTAL (UG/L AS AS) (01002) | BERYLLIUM, DISSOLVED (UG/L AS BE) (01010) | BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012) | BORON, DISSOLVED (UG/L AS B) (01020) | CADMIUM DISSOLVED (UG/L AS CD) (01025) | CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027) | CHROMIUM, DISSOLVED (UG/L AS CR) (01030) | CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB 1987 | | | | | | | | | | | |
| 18... | 0.2 | 13 | -- | -- | -- | -- | 280 | -- | -- | -- | -- |
| MAR | | | | | | | | | | | |
| 17... | 0.3 | 12 | 1 | 2 | <0.5 | <10 | 460 | <1 | <1 | <10 | <10 |

| DATE | COPPER, DISSOLVED (UG/L AS CU) (01040) | COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042) | IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045) | IRON, DISSOLVED (UG/L AS FE) (01046) | LEAD, DISSOLVED (UG/L AS PB) (01049) | LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051) | MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055) | MANGANESE, DISSOLVED (UG/L AS MN) (01056) | NICKEL, DISSOLVED (UG/L AS NI) (01065) | NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067) | ZINC, DISSOLVED (UG/L AS ZN) (01090) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB 1987 | | | | | | | | | | | |
| 18... | -- | -- | -- | 200 | -- | -- | -- | -- | -- | -- | -- |
| MAR | | | | | | | | | | | |
| 17... | 1 | 4 | 280 | 150 | <5 | <5 | 20 | 14 | <1 | 5 | 6 |

| DATE | ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092) | ALUMINUM, DISSOLVED (UG/L AS AL) (01106) | SELENIUM, DISSOLVED (UG/L AS SE) (01145) | SELENIUM, TOTAL (UG/L AS SE) (01147) | SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301) | SOLIDS, DISSOLVED (TONS PER DAY) (70302) | SOLIDS, DISSOLVED (TONS PER AC-FT) (70303) | PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507) | SPECIFIC CONDUCTANCE LAB (US/CM) (90095) | ALKALINITY LAB (MG/L AS CACO3) (90410) |
|---|---|---|---|---|---|---|---|---|---|---|
| FEB 1987 | | | | | | | | | | |
| 18... | -- | -- | -- | -- | 300 | 4.1 | 0.41 | 0.05 | 494 | 214 |
| MAR | | | | | | | | | | |
| 17... | <10 | 10 | <1 | <1 | 460 | 13 | 0.63 | 0.01 | 705 | 316 |

06178500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | TEMPERATURE, AIR (DEG C) (00020) | BAROMETRIC PRESSURE (MM OF HG) (00025) | CLOUD COVER (PERCENT) (00032) | WIND SPEED (MILES PER HOUR) (00035) | WEATHER (WMO CODE NUMBER) (00041) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | TURBIDITY (NTU) (00076) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (US/CM) (00095) | OXYGEN, DISSOLVED (MG/L) (00300) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | | |
| 14... | 1300 | 0.0 | -8.0 | 711 | 100 | E20 | 2 | 3.6 | 1.4 | 7 | 1420 | 10.0 |
| FEB | | | | | | | | | | | | |
| 18... | 1130 | 0.0 | 2.0 | 708 | 0 | E5.0 | 0 | 3.3 | -- | 10 | 1400 | 12.4 |
| MAR | | | | | | | | | | | | |
| 17... | 1430 | 0.5 | 1.0 | 703 | 100 | E5.0 | 2 | 3.2 | 2.3 | 18 | 1400 | 12.0 |

| DATE | OXYGEN, DISSOLVED (PERCENT SATURATION) (00301) | PH (STANDARD UNITS) (00400) | PH LAB (STANDARD UNITS) (00403) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | NITROGEN, TOTAL (MG/L AS N) (00600) | NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605) | NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610) | NITROGEN, NITRITE TOTAL (MG/L AS N) (00615) | NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625) | NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630) | PHOSPHORUS, TOTAL (MG/L AS P) (00665) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 14... | 74 | 7.9 | 7.83 | 13 | 0.9 | 0.09 | 0.61 | <0.01 | 0.7 | 0.20 | 0.01 |
| FEB | | | | | | | | | | | |
| 18... | 92 | 7.9 | 7.81 | 13 | 0.9 | 0.3 | 0.50 | <0.01 | 0.8 | 0.10 | 0.01 |
| MAR | | | | | | | | | | | |
| 17... | 91 | 8.1 | 7.84 | 8.1 | 1.4 | 0.91 | 0.39 | <0.01 | 1.3 | 0.10 | 0.02 |

| DATE | CARBON, ORGANIC TOTAL (MG/L AS C) (00680) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) | SODIUM, DISSOLVED (MG/L AS NA) (00930) | SODIUM ADSORPTION RATIO (00931) | PERCENT SODIUM (00932) | POTASSIUM, DISSOLVED (MG/L AS K) (00935) | CHLORIDE, DISSOLVED (MG/L AS CL) (00940) | SULFATE DISSOLVED (MG/L AS SO4) (00945) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 14... | -- | 400 | 0 | 81 | 47 | 190 | 4 | 51 | 6.9 | 6.0 | 280 |
| FEB | | | | | | | | | | | |
| 18... | -- | 400 | 0 | 83 | 47 | 190 | 4 | 50 | 7.2 | 6.9 | 290 |
| MAR | | | | | | | | | | | |
| 17... | 3.5 | 390 | 0 | 78 | 47 | 190 | 4 | 51 | 6.6 | 8.6 | 280 |

06178500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA

| DATE | FLUORIDE, DISSOLVED (MG/L AS F) (00950) | SILICA, DISSOLVED (MG/L AS SIO2) (00955) | ARSENIC DISSOLVED (UG/L AS AS) (01000) | ARSENIC TOTAL (UG/L AS AS) (01002) | BERYLLIUM, DISSOLVED (UG/L AS BE) (01010) | BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012) | BORON, DISSOLVED (UG/L AS B) (01020) | CADMIUM DISSOLVED (UG/L AS CD) (01025) | CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027) | CHROMIUM, DISSOLVED (UG/L AS CR) (01030) | CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 14... | 0.3 | 14 | -- | -- | -- | -- | 1700 | -- | -- | -- | -- |
| FEB | | | | | | | | | | | |
| 18... | 0.3 | 13 | -- | -- | -- | -- | 1900 | -- | -- | -- | -- |
| MAR | | | | | | | | | | | |
| 17... | 0.4 | 13 | 2 | 3 | <0.5 | <10 | 1700 | <1 | <1 | <10 | <10 |

| DATE | COPPER, DISSOLVED (UG/L AS CU) (01040) | COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042) | IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045) | IRON, DISSOLVED (UG/L AS FE) (01046) | LEAD, DISSOLVED (UG/L AS PB) (01049) | LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051) | MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055) | MANGANESE, DISSOLVED (UG/L AS MN) (01056) | NICKEL, DISSOLVED (UG/L AS NI) (01065) | NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067) | ZINC, DISSOLVED (UG/L AS ZN) (01090) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 14... | -- | -- | -- | 10 | -- | -- | -- | -- | -- | -- | -- |
| FEB | | | | | | | | | | | |
| 18... | -- | -- | -- | 12 | -- | -- | -- | -- | -- | -- | -- |
| MAR | | | | | | | | | | | |
| 17... | 1 | 4 | 670 | 10 | <5 | <5 | 180 | 180 | <1 | 4 | 11 |

| DATE | ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092) | ALUMINUM, DISSOLVED (UG/L AS AL) (01106) | SELENIUM, DISSOLVED (UG/L AS SE) (01145) | SELENIUM, TOTAL (UG/L AS SE) (01147) | SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301) | SOLIDS, DISSOLVED (TONS PER DAY) (70302) | SOLIDS, DISSOLVED (TONS PER AC-FT) (70303) | PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507) | NITROGEN, TOTAL (MG/L AS NO3) (71887) | SPECIFIC CONDUCTANCE LAB (US/CM) (90095) | ALKALINITY LAB (MG/L AS CACO3) (90410) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 14... | -- | -- | -- | -- | 940 | 9.2 | 1.3 | 0.02 | 4.0 | 1460 | 527 |
| FEB | | | | | | | | | | | |
| 18... | -- | -- | -- | -- | 960 | 8.6 | 1.3 | <0.01 | 4.0 | 1450 | 539 |
| MAR | | | | | | | | | | | |
| 17... | <10 | <10 | <1 | <1 | 940 | 8.1 | 1.3 | <0.01 | 6.2 | 1410 | 528 |

06173500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG.C) CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987
ONCE-DAILY

| DAY | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1390 | 1390 | 1410 | | | | | | | | | |
| 2 | 1420 | 1430 | 1350 | | | | | | | | | |
| 3 | 1410 | 1420 | 1400 | | | | | | | | | |
| 4 | 1400 | 1400 | 1360 | | | | | | | | | |
| 5 | 1430 | 1270 | 1290 | | | | | | | | | |
| 6 | 1420 | 1380 | 1180 | | | | | | | | | |
| 7 | 1330 | 1360 | 1110 | | | | | | | | | |
| 8 | 1450 | 1370 | 1080 | | | | | | | | | |
| 9 | 1500 | 1360 | 1200 | | | | | | | | | |
| 10 | 1500 | 1360 | 1320 | | | | | | | | | |
| 11 | 1470 | 1370 | 1360 | | | | | | | | | |
| 12 | 1460 | 1380 | 1420 | | | | | | | | | |
| 13 | 1430 | 1410 | 1430 | | | | | | | | | |
| 14 | 1420 | 1410 | 1380 | | | | | | | | | |
| 15 | 1460 | 1420 | 1380 | | | | | | | | | |
| 16 | 1590 | 1410 | 1390 | | | | | | | | | |
| 17 | 1580 | 1450 | 1390 | | | | | | | | | |
| 18 | 1520 | 1440 | 1410 | | | | | | | | | |
| 19 | 1520 | 1420 | 1410 | | | | | | | | | |
| 20 | 1500 | 1420 | 1370 | | | | | | | | | |
| 21 | 1510 | 1410 | 1400 | | | | | | | | | |
| 22 | 1490 | 1440 | 1400 | | | | | | | | | |
| 23 | 1500 | 1470 | 1380 | | | | | | | | | |
| 24 | 1500 | 1470 | 1390 | | | | | | | | | |
| 25 | 1490 | 1480 | 1410 | | | | | | | | | |
| 26 | 1490 | 1500 | 1410 | | | | | | | | | |
| 27 | 1470 | 1490 | 1360 | | | | | | | | | |
| 28 | 1450 | 1490 | 1440 | | | | | | | | | |
| 29 | 1440 | --- | 1430 | | | | | | | | | |
| 30 | 1430 | --- | 1480 | | | | | | | | | |
| 31 | 1430 | --- | 1460 | | | | | | | | | |
| TOTAL | 45400 | 39620 | 42200 | | | | | | | | | |
| MEAN | 1460 | 1420 | 1360 | | | | | | | | | |
| MAX | 1590 | 1500 | 1480 | | | | | | | | | |
| MIN | 1330 | 1270 | 1080 | | | | | | | | | |

06179000 - EAST FORK POPLAR RIVER NEAR SCOBEY, MT.

WATER QUALITY DATA

| DATE | TIME | TEMPERATURE (DEG C) (00010) | TEMPERATURE, AIR (DEG C) (00020) | BAROMETRIC PRESSURE (MM OF HG) (00025) | CLOUD COVER (PERCENT) (00032) | WIND SPEED (MILES PER HOUR) (00035) | WEATHER (WMO CODE NUMBER) (00041) | STREAMFLOW, INSTANTANEOUS (CFS) (00061) | TURBIDITY (NTU) (00076) | COLOR (PLATINUM-COBALT UNITS) (00080) | SPECIFIC CONDUCTANCE (US/CM) (00095) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 15... | 0900 | 0.0 | -22.0 | 720 | 0 | E0 | 0 | 3.5 | 2.2 | 9 | 1780 |
| FEB | | | | | | | | | | | |
| 18... | 1300 | 0.0 | 3.0 | 709 | 0 | E5.0 | 0 | 3.3 | 2.5 | 10 | 1320 |
| MAR | | | | | | | | | | | |
| 17... | 1600 | 0.5 | 1.0 | 704 | 100 | E5.0 | 2 | 3.5 | 2.0 | 16 | 1040 |

| DATE | OXYGEN, DISSOLVED (MG/L) (00300) | OXYGEN, DISSOLVED (PERCENT SATURATION) (00301) | PH (STANDARD UNITS) (00400) | PH LAB (STANDARD UNITS) (00403) | CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405) | NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605) | NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610) | NITROGEN, NITRITE TOTAL (MG/L AS N) (00615) | NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625) | NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630) | PHOSPHORUS, TOTAL (MG/L AS P) (00665) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 15... | 12.8 | 93 | 8.1 | 7.94 | 9.4 | 0.57 | 0.03 | <0.01 | 0.6 | <0.10 | 0.02 |
| FEB | | | | | | | | | | | |
| 18... | 11.8 | 87 | 8.2 | 8.01 | 5.7 | 0.28 | 0.02 | <0.01 | 0.3 | <0.10 | 0.01 |
| MAR | | | | | | | | | | | |
| 17... | 12.0 | 90 | 8.5 | 8.19 | 2.3 | 0.68 | 0.02 | <0.01 | 0.7 | <0.10 | 0.02 |

| DATE | CARBON, ORGANIC TOTAL (MG/L AS C) (00680) | HARDNESS (MG/L AS CACO3) (00900) | HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902) | CALCIUM DISSOLVED (MG/L AS CA) (00915) | MAGNESIUM, DISSOLVED (MG/L AS MG) (00925) | SODIUM, DISSOLVED (MG/L AS NA) (00930) | SODIUM ADSORPTION RATIO (00931) | PERCENT SODIUM (00932) | POTASSIUM, DISSOLVED (MG/L AS K) (00935) | CHLORIDE, DISSOLVED (MG/L AS CL) (00940) | SULFATE DISSOLVED (MG/L AS SO4) (00945) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 15... | -- | 470 | 0 | 90 | 60 | 250 | 5 | 53 | 8.5 | 10 | 360 |
| FEB | | | | | | | | | | | |
| 18... | -- | 320 | 0 | 58 | 43 | 170 | 4 | 53 | 6.8 | 7.8 | 260 |
| MAR | | | | | | | | | | | |
| 17... | 4.3 | 270 | 0 | 47 | 36 | 140 | 4 | 53 | 5.3 | 5.9 | 200 |

06179000 - EAST FORK POPLAR RIVER NEAR SCOBEY, MT.

WATER QUALITY DATA

| DATE | FLUORIDE, DISSOLVED (MG/L AS F) (00950) | SILICA, DISSOLVED (MG/L AS SIO2) (00955) | ARSENIC DISSOLVED (UG/L AS AS) (01000) | ARSENIC TOTAL (UG/L AS AS) (01002) | BERYLLIUM, DISSOLVED (UG/L AS BE) (01010) | BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012) | BORON, DISSOLVED (UG/L AS B) (01020) | CADMIUM DISSOLVED (UG/L AS CD) (01025) | CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027) | CHROMIUM, DISSOLVED (UG/L AS CR) (01030) | CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 15... | 0.4 | 6.9 | -- | -- | -- | -- | 2000 | -- | -- | -- | -- |
| FEB | | | | | | | | | | | |
| 18... | 0.3 | 6.0 | -- | -- | -- | -- | 1400 | -- | -- | -- | -- |
| MAR | | | | | | | | | | | |
| 17... | 0.3 | 6.0 | 1 | 2 | <0.5 | <10 | 1000 | <1 | <1 | <10 | <10 |

| DATE | COPPER, DISSOLVED (UG/L AS CU) (01040) | COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042) | IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045) | IRON, DISSOLVED (UG/L AS FE) (01046) | LEAD, DISSOLVED (UG/L AS PB) (01049) | LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051) | MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055) | MANGANESE, DISSOLVED (UG/L AS MN) (01056) | NICKEL, DISSOLVED (UG/L AS NI) (01065) | NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067) | ZINC, DISSOLVED (UG/L AS ZN) (01090) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | | |
| 15... | -- | -- | -- | 16 | -- | -- | -- | -- | -- | -- | -- |
| FEB | | | | | | | | | | | |
| 18... | -- | -- | -- | 32 | -- | -- | -- | -- | -- | -- | -- |
| MAR | | | | | | | | | | | |
| 17... | 1 | 5 | 260 | 29 | <5 | <5 | 30 | 13 | <1 | 4 | 3 |

| DATE | ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092) | ALUMINUM, DISSOLVED (UG/L AS AL) (01106) | SELENIUM, DISSOLVED (UG/L AS SE) (01145) | SELENIUM, TOTAL (UG/L AS SE) (01147) | SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301) | SOLIDS, DISSOLVED (TONS PER DAY) (70302) | SOLIDS, DISSOLVED (TONS PER AC-FT) (70303) | PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507) | SPECIFIC CONDUCTANCE LAB (US/CM) (90095) | ALKALINITY LAB (MG/L AS CACO3) (90410) |
|---|---|---|---|---|---|---|---|---|---|---|
| JAN 1987 | | | | | | | | | | |
| 15... | -- | -- | -- | -- | 1200 | 11 | 1.6 | 0.01 | 1810 | 612 |
| FEB | | | | | | | | | | |
| 18... | -- | -- | -- | -- | 840 | 7.5 | 1.1 | <0.01 | 1250 | 473 |
| MAR | | | | | | | | | | |
| 17... | 220 | <10 | <1 | <1 | 670 | 6.3 | 0.91 | <0.01 | 995 | 378 |

GROUND WATER LEVELS TO MONITOR

POTENTIAL DRAWDOWN DUE TO

COAL SEAM DEWATERING

Responsible Agency: Montana Bureau of Mines and Geology

| No. on Map | Sampling |
| --- | --- |
| 2 to 22 | Determine water levels quarterly |


GROUND WATER PIEZOMETERS TO MONITER POTENTIAL

DRAWDOWN DUE TO COAL SEAM DEWATERING

GROUND-WATER LEVEL MEASUREMENTS

| Well no. | Depth to water (feet) March 24, 1987 |
|---|---|
| 2 | 217.90 |
| 3 | 81.69 |
| 4 | 60.75 |
| 5 | 20.10 |
| 6 | 20.63 |
| 7 | 78.48 |
| 8 | 13.26 |
| 9 | 13.79 |
| 10 | 5.69 |
| 11 | -0.96 |
| 12 | dry |
| 13 | 134.68 |
| 14 | 212.36 |
| 15 | 224.11 |
| 16 | 37.20 |
| 17 | 247.95 |
| 18 | 247.66 |
| 19 | 126.06 |
| 20 | dry |
| 21 | 240.99 |
| 22 | 14.99 |

(-) Indicates water level above land surface